

CAREER GUIDE FOR PLUMBERS, PIPEFITTERS AND STEAMFITTERS

SOC Code: 47-2152.02

Pay Band: 3, 4 ([Salary Structure](#))

Standard Occupational Description: Assemble, install, and repair pipes, fittings, and fixtures of heating, water, and drainage systems, according to specifications and plumbing codes.

Plumber positions in the Commonwealth are assigned to the following Role(s) in the [Building Trades Career Group](#):

[Trades Technician III](#)

[Trades Technician IV](#)

While Plumbers within the Commonwealth are all located within the Building and Trades Career Group, individuals may want to pursue other staff or managerial opportunities within the Commonwealth depending upon individual training, education, knowledge, skills, abilities, and interests.

Other Career Group(s) that may be of interest are:

[Equipment Service and Repair](#)

[Transportation Operations](#)

[Utility Plant Operations](#)

SKILLS, KNOWLEDGE, ABILITIES AND TASKS

(Technical and Functional Expertise)

Skills

Note: The technical and functional skills listed below are based on general occupational qualifications for Plumbers commonly recognized by most employers. Typically, you will not be required to have all of the skills listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.

1. Installing equipment, machines, wiring, or programs to meet specifications.
2. Determining the kind of tools and equipment needed to do a job.
3. Controlling operations of equipment or systems.
4. Repairing machines or systems using the needed tools.
5. Adjusting actions in relation to others' actions.
6. Identifying the nature of problems.
7. Determining what is causing an operating error and deciding what to do about it.
8. Performing routine maintenance and determining when and what kind of maintenance is needed.
9. Inspecting and evaluating the quality of products.
10. Understanding written sentences and paragraphs in work related documents.
11. Listening to what other people are saying and asking questions as appropriate.
12. Using basic mathematics to solve problems.
13. Managing one's own time and the time of others.
14. Generating or adapting equipment and technology to serve user needs.

15. Analyzing needs and product requirements to create a design.
16. Watching gauges, dials, or other indicators to make sure a machine is working properly.
17. Knowing how to find information and identifying essential information.
18. Finding ways to structure or classify multiple pieces of information.
19. Talking to others to effectively convey information.
20. Assessing how well one is doing when learning or doing something.

Knowledge

Note: *The technical and functional knowledge statements listed below are based on general occupational qualifications for Plumbers commonly recognized by most employers. Typically, you will not be required to have all of the knowledge listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.*

The **Knowledge** of:

1. Materials, methods, and the appropriate tools to construct objects, structures, and buildings.
2. Machines and tools, including their designs, uses, benefits, repair, and maintenance.
3. Equipment, tools, mechanical devices, and their uses to produce motion, light, power, technology, and other applications.
4. Numbers, their operations, and interrelationships including arithmetic, algebra and geometry.
5. Design techniques, principles, tools and instruments involved in the production and use of precision technical plans, blueprints, drawings, and models.
6. The structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
7. Inputs, outputs, raw materials, waste, quality control, costs, and techniques for maximizing the manufacture and distribution of goods.
8. Principles and processes for providing customer and personal services.
9. Composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.

Abilities

Note: *The technical and functional abilities listed below are based on general occupational qualifications for Plumbers commonly recognized by most employers. Typically, you will not be required to have all of the abilities listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.*

The **Ability** to:

1. Imagine how something will look after it is moved around or when its parts are moved or rearranged.
2. Quickly make coordinated movements of one hand, a hand together with its arm, or two hands to grasp, manipulate, or assemble objects.
3. Make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.
4. Coordinate movements of two or more limbs together (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the body is in motion.
5. Bend, stretch, twist, or reach out with the body, arms, and/or legs.

6. Correctly follow a given rule or set of rules in order to arrange things or actions in a certain order. The things or actions can include numbers, letters, words, pictures, procedures, sentences, and mathematical or logical operations.
7. Keep the hand and arm steady while making an arm movement or while holding the arm and hand in one position.
8. See details of objects at a close range (within a few feet of the observer).
9. Tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
10. Make fast, simple, repeated movements of the fingers, hands, and wrists.

Tasks

Note: The following is a list of sample tasks typically performed by Plumbers. Employees in this occupation will not necessarily perform all of the tasks listed.

1. Repairs and maintains plumbing by replacing defective washers, replacing or mending broken pipes, and opening clogged drains.
2. Assembles pipe sections, tubing and fittings, using screws, bolts, solder, plastic solvent, and caulking.
3. Installs pipe assemblies, fittings, valves, and fixtures, such as sinks, toilets and tubs, using hand and power tools.
4. Studies building plans and inspects structure to determine required materials and equipment and sequence of pipe installations.
5. Cuts opening in structures to accommodate pipe and pipe fittings, using hand and power tools.
6. Locates and marks position of pipe installations and passage holes in structures, using measuring instruments, such as ruler and level.
7. Cuts, threads, and bends pipe to required angle, using pipe cutters, pipe-threading machine, and pipe bending machine.
8. Fills pipes or plumbing fixtures with water or air and observes pressure gauges to detect and locate leaks.
9. Directs workers engaged in pipe cutting and pre-assembly and installation of plumbing systems and components.

INTERESTED?

Like people, occupations have traits or characteristics. These characteristics give important clues about the nature of the work and work environment, and give you an opportunity to match your own personal interests to a specific occupation. When you choose a job in an occupation that matches your own interests you have taken an important step in planning a successful and rewarding career.

Plumbing work is called a “Realistic Occupation” because it involves work activities that include practical, hands-on problems and solutions. Realistic occupations deal with real-world materials like wood, tools, and machinery. Jobs in realistic occupations often require working outside and do not involve a lot of paperwork or working closely with others.

LICENSURE, REGISTRATION, OR CERTIFICATION REQUIREMENTS

Generally this is not required for Plumber positions in state government. However, to improve career advancement opportunities, you should consider the advantages of certification and include this step in your self-development plan.

Licensing information can be found on the Department of Professional & Occupational Regulations' web site at http://www.state.va.us/dpor/conNEW_reg.pdf

EDUCATIONAL, TRAINING, AND LEARNING OPPORTUNITIES

Skilled trades occupations usually require a high school diploma and may require some vocational training or job-related course work. Plumbers usually complete an instructional program that prepares individuals to apply technical knowledge and skills to form, shape, bend and fold extruded metals, including the creation of new products, using hand tools and machines such as cornice brakes, forming rolls, and squaring shears.

Sources of educational, training, and learning opportunities include:

1. US Military Service
2. On-the-job Training
3. One of the Commonwealth's technical high schools. (Check with your local school district for technical high school information.)
4. Virginia Community College System
5. Talk to a supervisor or supervisor whom you believe "has it all together".
6. Commonwealth Technical Centers that offer an instructional program that prepares individuals to apply technical knowledge and skills in both sheet metal fabrication and installation.
7. Skilled trades organizations that you may wish to join.

Apprenticeship generally is considered to be the best way to learn this trade. In Virginia, apprenticeship programs are administered by the Apprenticeship Division of the Virginia Department of Labor and Industry (DOLI). Apprenticeship programs usually consist of 4 or 5 years of on-the-job training and a minimum of 144 hours per year of classroom instruction. Apprenticeship programs provide comprehensive instruction in both sheet metal fabrication and installation. Detailed information on Apprenticeship programs is available on the DOLI web site at <http://www.doli.state.va.us>

COMMONWEALTH COMPETENCIES

Competencies are a set of identified behaviors, knowledge, skills, and abilities that directly and positively impact the success of employees and the organization. Competencies can be observed and measured. When consistently demonstrated, competencies make employees particularly effective in their work. Competencies help lay out a road map to career success. You can use the Commonwealth Competencies to help improve your individual performance by adopting behaviors that make high performing employees successful in their jobs. In this way, you can use the Commonwealth Competencies for your further professional development.

The Commonwealth Competencies are:

1. Technical and Functional Expertise
2. Understanding the Business
3. Achieving Results
4. Serving the Customer
5. Teamwork
6. Interpersonal and Communication Skills
7. Leadership and Personal Effectiveness

The above competencies may be applied to employees throughout the Commonwealth of Virginia. They can be rank-ordered by agencies and hiring managers to represent the needs of a specific job. The rank ordering will change depending upon the occupation, an organization's priorities, the actual job requirements, and the supervisor's preferences.

Career success is both about what you do (applying your technical knowledge, skills, and ability) and how you do it (the consistent behaviors you demonstrate and choose to use) while interacting and communicating with others. Hopefully, by studying the Commonwealth competencies, identifying your developmental opportunities, and working to refine your own competence, you can take charge of your career!

For additional information about the **Commonwealth Competencies** go to: http://jobs.state.va.us/cc_planningctr.htm. For the competencies, we first list the competencies and then define each. Finally, we list competency indicators; to describe what successful performance looks like.

COMMONWEALTH CAREER PATH

Career opportunities in the Commonwealth are not limited to moving “up” to the next highest role and pay band, changing positions, or to becoming a supervisor. That’s because most roles describe a broad group of occupationally related positions that perform a range of work that requires increased knowledge and skills. For that reason, Commonwealth roles describe the career paths within the same or higher-level role for the same or different Career Group. The broad salary range and the Commonwealth’s pay practices provide flexibility in recognizing career development and advancement. ([Salary Structure](#))

For example:

Pay Band	Role		Pay Band	Role
3	Trades Technician III	→	3	Trades Technician III
	↓			
4	Trades Technician IV	→	4	Trades Technician IV
	↓			
5	Trades Manager I	→	5	Trades Manager I
	↓			
6	Trades Manager II	→	6	Trades Manager II

Many employers, including the Commonwealth, expect trades professionals to gain knowledge, skills, and abilities in more than one area. Multi-skilled workers can add value to the organization and often find that a variety of work assignments can be rewarding.

Sample Career Path

Trades Tech III

The Trades Technician III role provides career tracks for trade technicians performing a skilled trade in a specialty area whose work ranges from journey level technician to lead. Some employees may supervise a small crew/staff.

Trades Tech IV

The Trades Technician IV role provides career tracks for the trades technicians whose responsibilities range from the expert technicians to first line supervisors of trades technicians in one or more specialty areas. The expert trades technician provides guidance to other technicians or works on a "multi-trade" team requiring specialized skills and knowledge in several trades areas.

Trades Manager I

The Trades Manager I role provides career tracks for managers whose responsibilities range from assisting in the planning and direction of a buildings and grounds program to managing a comprehensive building and grounds program for facilities such as a training center, rehabilitation center, or hospital. Areas managed may include a power plant, buildings and mechanical maintenance, ground maintenance, housekeeping and related services.

Trades Manager II

The Trades Manager II role provides career tracks for managers who plan and direct a buildings and grounds program at a state agency or institution having multiple facilities characterized by a large total resident and staff population engaged in highly diversified and decentralized activities.

ADDITIONAL OCCUPATIONAL INFORMATION CAN BE FOUND AT:

O*NET

http://online.onetcenter.org/cgi-bin/gen_search_page?1

Virginia Employment Commission

<http://www.alex.vec.state.va.us/>

Department of Professional & Occupation Regulation

http://www.state.va.us/dpor/conNEW_reg.pdf

Career One Stop

<http://www.careeronestop.org/>

Virginia Career Resource Network

<http://www.vacrn.net/>

